

# Jinpei Guo (郭锦沛)

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## EDUCATION

### Carnegie Mellon University (CMU)

Master of Science in Machine Learning

Pittsburgh, PA

Aug. 2024 – Present

### Shanghai Jiao Tong University

Bachelor in Computer Science and Technology, GPA: 91.85/100.00, Top 5/109

Shanghai, China

Sep. 2020 – Jun. 2024

Honorary Bachelor of Zhiyuan College

Sep. 2020 – Jun. 2024

## SKILLS

- Programming Language: C/C++, Python, Matlab, etc.
- Machine (Deep) Learning Related Knowledge: LLM, Generative AI, CV, NLP, Combinatorial Optimization (CO)

## WORK EXPERIENCE

- **Alipay** | Shanghai, China Apr. 2024 - Jul. 2024  
*Machine Learning Engineer Intern | Python, Large Language Model (LLM)* *Financial AI Team*
  - Developed a K-Means-based algorithm in Python to filter financial data with a target mean value from over 1 billion entries, resulting in a more than **99.9%** reduction in processing time while maintaining comparable performance to commercial solvers like Gurobi on datasets of 100,000 entries.
  - Designed a time-series forecasting pipeline utilizing **LLMs** to predict future financial data from historical data, achieving over a **15%** average improvement in accuracy compared to classical methods like *Prophet*.
  - Proposed a "time2text" **embedding** method to project time features into the textual domain, enabling LLMs to leverage pretrained textual knowledge for improved forecasting.
  - The model has been successfully integrated into Alipay's assembly line, specifically for large-scale forecasting tasks within the Alipay Huabei system.
- **Shanghai Jiao Tong University** | Shanghai, China Nov. 2021 - Jul. 2024  
*Undergraduate Researcher | Generative AI, CV, Optimization* *Advisor: Prof. [Junchi Yan](#)*
  - Graph Matching Transformer: Proposed the Graph Matching **Transformer** to extract key-point features from images for graph matching tasks. Applied transformer architecture to solve quadratic assignment problems, achieving **4%** accuracy improvement on two widely used graph matching benchmarks.
  - Diffusion-based Model for CO: Developed a **probabilistic diffusion solver** for CO problems on graphs, addressing NP-hard problems such as **TSP** and **MIS**. Achieved 50% improvement over previous SOTA learning-based frameworks and significantly reduced solving time by 99% compared to heuristic solvers.
  - Consistency Optimization Model: Introduced a **consistency optimization model** for CO problems, where all trajectories converge to a single point. The model achieved **SOTA** on TSP and MIS problems compared to learning-based frameworks and reduced average solving time by **70%** compared to diffusion-based solvers.
- **University of Toronto** | Remote Apr. 2023 - Sept. 2023  
*Undergraduate Researcher | Automated Reasoning, Optimization* *Advisor: Prof. [Xujie Si](#)*
  - SATNet\*: Proposed an end-to-end framework named SATNet\* to learn the propositional logic of puzzles such as Sudoku. The parameters of SATNet\* are **interpretable**, ensuring that the logical inference is reliable. By using the exact solver Gurobi, the framework guarantees **100% reliable solutions** to logic puzzles.
  - Comprehensive SAT Dataset for GNNs: Developed a comprehensive dataset for SAT problems, encompassing seven SAT distributions. Explored various graph construction methods and graph neural networks (GNNs) to solve SAT problems, and concluded that recurrent GNNs mimic the solving strategy of local-search heuristics.

## RESEARCH PAPERS (\* denotes equal contribution)

1. **Graph Matching Transformers**  
*ICASSP 2024 | Jinpei Guo, Shaofeng Zhang, Runzhong Wang, Chang Liu, Junchi Yan*
2. **Learning Reliable Interpretations with SATNet**  
*NeurIPS 2023 | Zhaoyu Li, Jinpei Guo, Yuhe Jiang, Xujie Si*
3. **From Distribution Learning in Training to Gradient Search in Testing for Combinatorial Optimization**  
*NeurIPS 2023 | Yang Li, Jinpei Guo, Runzhong Wang, Junchi Yan*
4. **G4SATBench: Benchmarking and Advancing SAT Solving with Graph Neural Networks**  
*TMLR | Zhaoyu Li, Jinpei Guo, Xujie Si*
5. **OptCM: The Optimization Consistency Models for Solving Combinatorial Problems in Few Shots**  
*NeurIPS 2024 (under review) | Yang Li\*, Jinpei Guo\*, Runzhong Wang, Hongyuan Zha, Junchi Yan*

**I am available for internship from May to September, 2025.**